Space Weather Forecast

Issued on Thursday, 01 September 2022 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of M-flares (R1-R2 Blackouts). Chance of G1/Minor Storm day 3 (03 Sep).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity was Low, with no significant solar flares. There are two sunspot regions on the visible disc. The most prominent is in the centre south of the disc, but despite magnetic complexity, appears relatively inactive. A small region in the centre of the northern hemisphere is very benign. No new CMEs have been observed on available imagery.

Solar Wind / Geomagnetic Activity: Solar wind speeds are easing as the Earth moves away from an area of faster solar wind. Total magnetic field strength was mainly moderate, but fell to weak for a brief period. The important north-south component varied weakly, but with an increasingly large amplitude later in the period. Geomagnetic activity was mainly Quiet to Unsettled (Kp1-3) with one Active interval late in the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels, with no solar radiation storms occurring

Four-Day Space Weather Forecast Summary
Solar Activity: Activity is Low. There is a slight chance, however, of isolated M-flares from the large region in the south-centre disc, with a very slight chance of X-flares.

Solar Wind / Geomagnetic Activity: An eruption on 30 August produced a CME which may give a glancing blow at Earth, most likely later on day 3 (03 September). Solar wind speeds are expected to decline through day 1 (01 September). Increases are then forecast from later on day 2 onwards due to the connection with two consecutive fast solar wind regions. The first is due to connect later on 02 September with the second likely to affect the Earth from either late on 03 September or during 04 September.

Geomagnetic activity is expected to be Quiet to Unsettled on day 1, perhaps with an isolated Active interval at first. Further Unsettled to Active intervals are then possible through days 2 to 4, with a chance of G1/Minor Storm intervals due mainly to the effects of the coronal hole high speed streams and any preceding CIR (co-rotating interaction region), along with the potential CME arrival on day 3.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain below the Minor Radiation Storm level (S1). There remains a slight chance of further increases to or above the S1 level, should any significant flares occur from the large region on the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	30	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	20	20	20	20
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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